AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of orienting a semiconductor wafer during semiconductor fabrication with the aid of an optical alignment system, the semiconductor wafer having an alignment mark with regular structures, on the basis of which the position of the semiconductor wafer can be determined comprising:

a) determining a first position information item of the alignment mark in a predetermined direction with the aid of an optical measurement method that is optimized for position determination;

b) determining a line profile of the alignment mark in the predetermined direction with the aid of an optical measurement method that is optimized for profile determination;

c) determining a second position information item of the alignment mark in the predetermined direction, the first position information item determined in a) being corrected with the aid of the line profile of the alignment mark determined in b); and

d) positioning the semiconductor wafer by utilizing the second position information item of the alignment mark ~~for a positioning of the semiconductor wafer~~.

2. (Previously presented) The method as claimed in claim 1, a) further comprising:

aa) scanning the alignment mark in the predetermined direction with the aid of an alignment microscope, the alignment mark being illuminated with light radiation from a light source, and an optical parameter of the light radiation, which is influenced by the alignment mark, being measured in a spatially resolved manner in dependence on the relative position of the alignment mark with respect to the alignment microscope;

ab) generating an intensity profile of the optical parameter for the alignment mark in the predetermined direction, relative positions of the alignment mark with respect to the alignment microscope being determined in the case of which the optical parameter exceeds or falls below a predetermined threshold value; and

ac) calculating the first position information item of the alignment mark in the predetermined direction with the aid of the intensity profile determined in method step ab).

3. (Previously presented) The method as claimed in claim 2, wherein the intensity, the phase or the polarization of the light radiation is influenced by the alignment mark being measured as the optical parameter in aa).

4. (Previously presented) The method as claimed in Claim 1, wherein b) comprises:

ba) scanning the alignment mark in the predetermined direction with the aid of an optical scattered radiation measuring device, the alignment mark being illuminated with light radiation from a light source and a diffraction pattern which arises as a result of the interaction of the light radiation with the regular structures of the alignment mark being detected; and

bb) determining the line profile of the alignment mark in the predetermined direction from the diffraction pattern detected in substep ba), the diffraction pattern being evaluated with the aid of a data processing device.

5. (Previously presented) The method as claimed in Claim 2, wherein in c), the second position information item of the alignment mark being calculated with the aid of the two profiles is determined by a procedure which effects the determination of an offset between the position of a first region, which, in the measured intensity profile determines the position of the alignment mark and is dependent on the course of the line profile and the position of a second region, which is selected according to a predetermined criterion from the line profile and is largely independent of the course of the line profile, and the addition of the offset to the first position information item of the alignment mark.

6. (Previously presented) The method as claimed in Claim 1, wherein the first optical measurement method utilizes an edge contrast, a phase contrast, a diffraction contrast or a Fresnel zone method.

7. (Previously presented) The method as claimed in Claim 1, wherein the regular structures comprising line grids are oriented orthogonally with respect to the predetermined direction.

8. (Previously presented) The method as claimed in Claim 1, wherein the orientation of the semiconductor wafer takes place with the aid of at least two alignment marks arranged on the wafer surface.

9. (Previously presented) An apparatus having an optical alignment system for determining the position of an alignment mark, which is arranged on the surface of the semiconductor wafer and has regular structures the optical alignment system comprising:

- a first optical measuring device for determining a first position information item of the alignment mark in a predetermined direction with the aid of an optical measurement method that is optimized for position determination,

- a second optical measuring device for determining a line profile for the alignment mark in the predetermined direction with the aid of an optical measurement method that is optimized for line profile determination,

a data processing device configured to determine a second position information item of the alignment mark by correcting the first position information item utilizing the line profile of the alignment mark, and

- a positioning device configured for setting the relative position of the semiconductor wafer with respect to the second position information item.

10. (Previously presented) The apparatus as claimed in claim 9, wherein the first optical measuring device comprises an alignment microscope, said alignment microscope configured to scan the alignment mark and measure an optical parameter of a light radiation influenced by the alignment mark.

11. (Currently amended) The apparatus as claimed in claim 9, wherein the second optical measuring device comprising an optical scattered radiation measuring device for detecting diffraction patterns which are caused by the interaction of light radiation from a light source with the regular structures of the alignment mark.

12. (Canceled)

13. (Previously presented) The apparatus as claimed in claim 9, wherein the data processing device is designed to determine the line profile of the alignment mark from the diffraction patterns.

14. (Previously presented) The apparatus as claimed in claim 13, wherein the data processing device has a comparison device configured to adjust the diffraction patterns determined with diffraction patterns of a database.

15. (Previously presented) The apparatus as claimed in claim 9, wherein the optical alignment system being arranged within a lithography installation.

16. (Previously presented) The method as claimed in claim 1, wherein b) comprises:

ba) scanning the alignment mark in the predetermined direction with the aid of an optical scattered radiation measuring device, the alignment mark being illuminated with light radiation from a light source and a diffraction pattern which arises as a result of the interaction of the light radiation with the regular structures of the alignment mark being detected; and

bb) determining the line profile of the alignment mark in the predetermined direction from the diffraction pattern detected in ba), the diffraction pattern adjusted with diffraction patterns from a database.

17. (Previously presented) The method as claimed in claim 1, wherein the regular structures comprise point grids oriented orthogonally with respect to the predetermined direction.